

REMARKS

Applicants respectfully request reconsideration of the application, as amended, in view of the following remarks.

The rejection of the claims under 35 USC 112, 1st paragraph is obviated by the amendment of Claims 10 and 17.

The present invention as set forth in **Claim 1** relates to a precipitated silica having the following **physicochemical characteristics**:

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| BET surface area | from 50 to 700 m²/g; |
| DBP absorption | from 100 to 450 g/100 g; |
| Choline chloride absorption | from 150 to 400 g/100 g (75% absorption by weight aqueous solution); |
| CTAB surface area | from 50 to 350 m²/g; |
| DBP/choline chloride absorption | less than 1.07; and |
| <u>Sears number</u> | <u>greater than 25 ml/5g.</u> |

Amended Claim 10 relates to a process for preparing precipitated silica, comprising:
simultaneously metering into an aqueous silicate solution more aqueous silicate solution and a Lewis and/or Brønsted acid over a precipitation period of 40 to 65 minutes followed by reacidifying the mixture to a pH of 7-3.0 to provide an acidified mixture having a solid content of the suspension of from 79.3 to 104 g/l,
optionally filtering the acidified mixture to obtain a filtered precipitated silica,
optionally drying the filtered precipitated silica,

wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 15, and

wherein said silica has the following physicochemical characteristics:

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| BET surface area | from 50 to 700 m²/g; |
| DBP absorption | from 100 to 450 g/100 g; |
| Choline chloride absorption | from 150 to 400 g/100 g (75% absorption by weight aqueous solution); |
| CTAB surface area | from 50 to 350 m²/g; |
| DBP/choline chloride absorption | less than 1.07; |
| Sears number | greater than 25 ml/5g. |

Amended Claim 17 relates to a process for preparing precipitated silica, comprising:
simultaneously metering into a vessel an aqueous silicate solution and a Lewis and/or Brønsted acid over a precipitation period of 40 to 65 minutes followed by reacidifying the mixture to a pH of 7-3.0 to provide to provide an acidified mixture having a solid content of the suspension of from 79.3 to 104 g/l,

optionally filtering the acidified mixture to obtain a filtered precipitated silica,
optionally drying the filtered precipitated silica,

wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 15, and

wherein said silica has the following physicochemical characteristics:

| | |
|------------------------------------|--|
| BET surface area | from 50 to 700 m²/g; |
| DBP absorption | from 100 to 450 g/100 g; |
| Choline chloride absorption | from 150 to 400 g/100 g (75% absorption |

| | |
|--|--|
| | by weight aqueous solution); |
| CTAB surface area | from 50 to 350 m²/g; and |
| DBP/choline chloride absorption | less than 1.07; |
| Sears number | greater than 25 ml/5g. |

EP '755 and Türk, alone or in combination, fail to disclose or suggest a precipitated silica having the following **physicochemical characteristics** as claimed in Claim 1.

| | |
|--|--|
| BET surface area | from 50 to 700 m²/g; |
| DBP absorption | from 100 to 450 g/100 g; |
| Choline chloride absorption | from 150 to 400 g/100 g (75% absorption by weight aqueous solution); |
| CTAB surface area | from 50 to 350 m²/g; |
| DBP/choline chloride absorption | less than 1.07; and |
| <u>Sears number</u> | <u>greater than 25 ml/5g.</u> |

EP '755 and Türk, alone or in combination, fail to disclose or suggest a process as claimed in Claim 10 for preparing precipitated silica having the combination of properties as claimed in Claim 10, comprising:

simultaneously metering into an aqueous silicate solution more aqueous silicate solution and a Lewis and/or Brønsted acid over a precipitation period of 40 to 65 minutes followed by reacidifying the mixture to a pH of 7-3.0 to provide an acidified mixture having a solid content of the suspension of from 79.3 to 104 g/l,

wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 15.

EP '755 and Türk, alone or in combination, fail to disclose or suggest a process as claimed in Claim 17 for preparing precipitated silica having the combination of properties as claimed in Claim 17, comprising:

simultaneously metering into a vessel an aqueous silicate solution and a Lewis and/or Brønsted acid over a precipitation period of 40 to 65 minutes followed by reacidifying the mixture to a pH of 7-3.0 to provide to provide an acidified mixture having a solid content of the suspension of from 79.3 to 104 g/l,

wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 15.

Regarding Claims 10 and 17, the specific process steps are not disclosed or suggested in EP '755 and Türk, alone or in combination.

Regarding EP '755, the Examiner has argued that a Sears number of greater than 25 ml/5g is obvious and expected in view of the Sears number of 22.6 ± 0.25 ml/5g of Product C Versuch 13 of EP '755 and in view of 19.9 ± 0.25 ml/5g of Product A Versuch 6 of EP '755. However, there is a difference of at least 10 % between the claimed Sears number and the Sears number of EP '755. The margin of error is very small (± 0.25 ml/5g). This was already discussed in the Rule 132 Declaration of Dr. Ralph Rausch, signed on April 18, 2007 and the Rule 132 Declaration of Dr. Görl signed October 19, 2007 (both of record).

The increase of the Sears number by at least 10% compared to EP '755 is significant because it is necessary to achieve a sufficient affinity between the silica of the invention and hydrophilic liquids. Without such affinity the desired DBP/CC ratio of below 1.07 cannot be

reached. The inventors have found that for a given set of other physico-chemical properties of a silica, a borderline exists for the Sears number which has to be exceeded. Therefore an increase of 10 % in Sears number is significant. See item 13 in the attached Rule 132

Declaration.

The difference of at least 10 % between the claimed Sears number and the Sears number of EP '755 is not obvious. It is very difficult to increase the Sears number and at the same time keep all other parameter as claimed in the ranges as claimed. The Sear number is rather complex in its emergence: factors like temperature, precipitation time and pH and speed are considered, although the complete mechanism is not entirely understood from a theoretical point of view. What is know is that even minor changes in the parameters used for the process of making may result in a different outcome. As a result, it is very difficult to simply raise the Sears number while keeping all other properties in the claimed range.

In other words, based on EP '755 there is no suggestion as to how to increase the Sears number to greater than 25 ml/5g and keep the BET surface area from 50 to 700 m²/g; the DBP absorption from 100 to 450 g/100 g; the choline chloride absorption from 150 to 400 g/100 g (75% absorption by weight aqueous solution); the CTAB surface area from 50 to 350 m²/g; the DBP/choline chloride absorption less than 1.07.

Contrary to the Examiner's believe, there is no linear relationship between all parameters. If one parameter is changed, it cannot be predicted how the other parameters will change. Therefore, simply increasing the alkaline number in EP '755 does not increase the Sears number while keeping all other parameters constant.

In fact, the prior art cited by the Examiner discloses that increasing the alkaline number would lead to an increase of the DBP (see Example 19 of Türk). The closest Example of EP '755 (C13) has a Sears number of 22.6 ml/5g, and an alkaline number of 7, DBP = 216 g/100g, CC-absorption = 205 g/100g and DBP/CC = 1,05.

Türk teaches away from increasing the alkaline number as this would increase the DBP.

Even assuming only a minimal increase of the DBP from 216 g/100g to 220 g/100g, this would cause that the ratio DBP/CC-absorption of example C13 of EP '755 would increase to 1,073 which would be out of the claimed range of the present invention. Türk, however, teaches that the increase of the DBP would be higher than 4 g/100g. Thus, a person of ordinary skill in the art starting with example C13 of EP'755 would not consider increasing the alkaline number because Türk teaches that this would cause a shift of the DBP/CC ratio out of the claimed range.

Further, the Sears number was increased in the present invention, for example, as disclosed at page 2, lines 17 to 20 of the specification, where it is explicitly pointed out that the silanol group density (= Sears number) is determined by the alkali number [AN], or in other words by the variation of pH/AN during precipitation.

The patents cited in EP '755 do not sufficiently disclose the variation of pH/AN during the precipitation process. Even considering the complete disclosure of the manufacturing process disclosed in EP '755 in combination with the in the references DE 1467019, DE 3144299 and DE 19526476 (cited in EP '755), it is found that there is no disclosure by which a Sears number of > 25 could be achieved. This is due to the fact that the Sears number, or in other words the number of silanol groups on the silica surface, is determined by the variation of pH/AN during precipitation, whereas all manufacturing processes disclosed in EP '755 in combination with those disclosed in the patents cited therein are incapable of any variation whatsoever of the pH values or alkali numbers.

Further, the Examiner is referring to similarities of the methods of EP '755 and the present invention as indication that similar Sears numbers are achieved. Applicants disagree.

Three different types of precipitated silica, A, B, and C, are described in EP '755. All three have different production methods. The methods for the precipitated silica A and B are so-called "pH precipitation methods," in which the pH is kept constant during the precipitation (see Examples 1 and 2 of EP '755). The method of the present invention is a so-called "AN precipitation method," in other words the alkali number (AN) is kept constant. It was already pointed out in the specification of the present application that pH precipitation methods are something different, and lead to different precipitated silica than AN precipitation methods (see page 3, lines 6-18). Thus, the methods for making precipitated silica types A and B of EP '755 are different and cannot result in the precipitated silica of the present invention.

The silica C from Example 3 of EP '755 is prepared using AN precipitation. The method according to Example 3 of EP '755 nevertheless differs decisively from that of the present invention, as the following table shows:

| Method parameters | EP '755, Example 3 | Invention, Examples 1-8 |
|--|-----------------------|----------------------------|
| Precipitation time (min) | 90 | 40-65 |
| Precipitation temperature (°C) | 91-93 | 85 |
| Alkali number | 7 | 20-40 |
| Solid content of the suspension (g/l) | 72 | 80-105 |

As can be seen, numerous significant parameters of the method of the present invention are clearly different. Thus, the precipitation time is not even half as long as in EP '755, in some instances. The alkali number is 3-6 times greater.

The total combination of method parameters brings about the clearly different surface chemistry. Therefore, as shown above, the Sears number is a clear distinction criterion.

Sears numbers of greater than 25 are neither disclosed nor made obvious by EP '755 even in combination with Türk.

Therefore, the rejection of Claims 1, 4-5, 10-12, 14-19 and 22-28 under 35 U.S.C. § 103(a) as being unpatentable over EP 0937755 in view of Türk et al are believed to be unsustainable as the present invention is neither anticipated nor obvious and withdrawal of these rejections is respectfully requested.

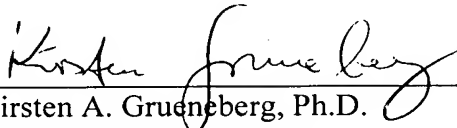
This application presents allowable subject matter, and the Examiner is kindly requested to pass it to issue. Should the Examiner have any questions regarding the claims or otherwise wish to discuss this case, he is kindly invited to contact Applicants' below-signed representative, who would be happy to provide any assistance deemed necessary in speeding this application to allowance.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
NFO:KAG:


Kirsten A. Gruenberg, Ph.D.
Registration No.: 47,297